Sacramento River Winter-run Chinook ESU

Hatchery Program Assessment

Shirley Witalis

Sacramento River Winter-run Chinook ESU

- SR winter-run Chinook included in the ESU
  - Livingston Stone National Fish Hatchery winter-run program
  - Winter-run Captive Broodstock program
- SR winter-run Chinook not included in the ESU
  - none

Sacramento River Winter-run ESU programs

Sacramento River Winter-run Chinook Salmon ESU

Population area (hatchery stock)	Isolated or integrated	Program type	Purpose	Production goal	Year initiated
Sacramento River (LSNFH)	Integrated	Smolt	Conservation	250,000	1989
S.R. Winter-run Captive Broodstock	Integrated	Captive	Conservation	N/A	1991

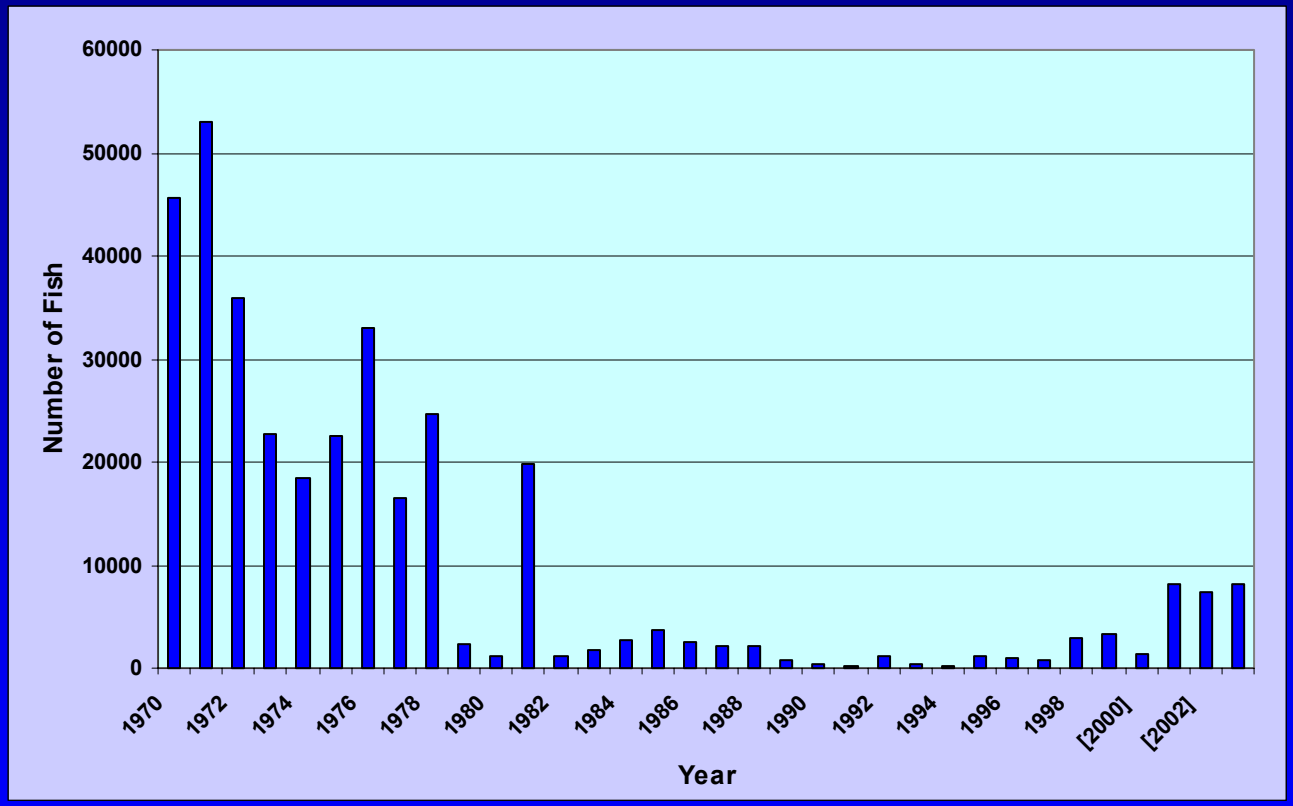
Viable Salmon Populations

Abundance
Productivity
Spatial Structure
Diversity

Effect on Abundance

- The winter-run program has contributed to the abundance of the population and ESU.
- Population numbers have increased since the start of the program. In 1991, escapement was estimated to be 211 fish. In 1994, numbers were down to 186.
- In 2003, winter-run returns were estimated at 8,190 fish.

Winter-run Escapement 1970-2003



Effect on Productivity

- The winter-run Chinook salmon population has increased in abundance, and post-spawned hatchery winter-run carcasses have been surveyed. The program had contributed to productivity.

- Current study with captive x wild vs. wild x wild progeny to compare fitness and productivity.

Effect on Spatial Structure

- The winter-run ESU is currently contains a single population.
- Abundance has increased increased density but has not affected spatial distribution. The population is artificially maintained in the upper Sacramento River mainstem. Ten miles of winter-run spatial distribution has been recently been lost through warm water pulses from Keswick Dam, causing winter-run to move upward.
- Future: a second, established population in upper Battle Creek.

Effect on Diversity

- The winter-run conservation program has contributed to diversity by following spawning matrices that maximize genetic diversity.
- Adult returns must be genetically confirmed as winter-run before being accepted as broodstock for the program.
- There are two captive broodstock components to the program that maintain the winter-run genome and representation of family lines.
- Research with captive stock has allowed the development of genetic markers for winter-run, and contributions to the body of knowledge on captive broodstocks.

Effect of Artificial Propagation on VSP Attributes Sacramento River Winter-run Salmon

Viability Criteria	BRT VSP Risk Score	Decreases Risk	Neutral or Uncertain	Increases Risk
Abundance	3.7	√		
Productivity	3.5		√	
Spatial Structure	4.8		√	
Diversity	4.2	√		

Recommendation: No Change to BRT's Finding

What is the biological status of the ESU in total (including hatchery stocks/populations, mixed populations, and natural populations)?

SR winter-run Chinook salmon	Biological Status for the ESU in-total		
	"in danger of extinction throughout all or a significant portion of its range"	"likely to become endangered within the foreseeable future throughout all or a significant portion of its range"	Neither "in danger of extinction…" or "likely to become endangered…"
BRT's findings for the ESU natural components	59%	38%	3%